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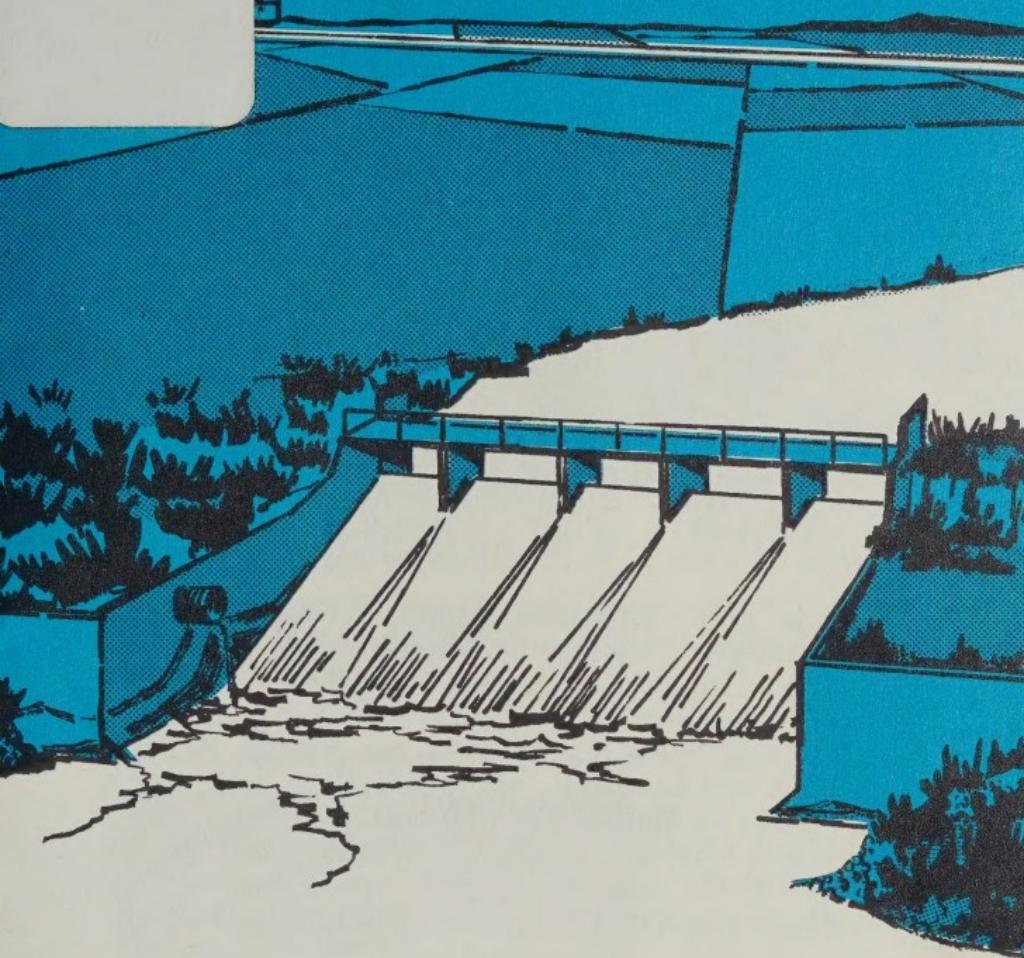
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ST. MARY IRRIGATION PROJECT

PFRA

Prairie farms rehabilitation admin

CANADA DEPARTMENT OF AGRICULTURE

EARLY HISTORY

The St. Mary Irrigation Project was first conceived as a commercial venture by The Canadian Northwest Irrigation Company, organized in 1892 by E. T. Galt of Lethbridge and financed with British capital. Later consolidated under the name of the Alberta Railway and Irrigation Company, the organization took over a large block of land in the Magrath, Raymond, Lethbridge and Coaldale districts. This land was originally granted to the Galt interests by the Government of Canada as subsidies for construction of railways in the area.

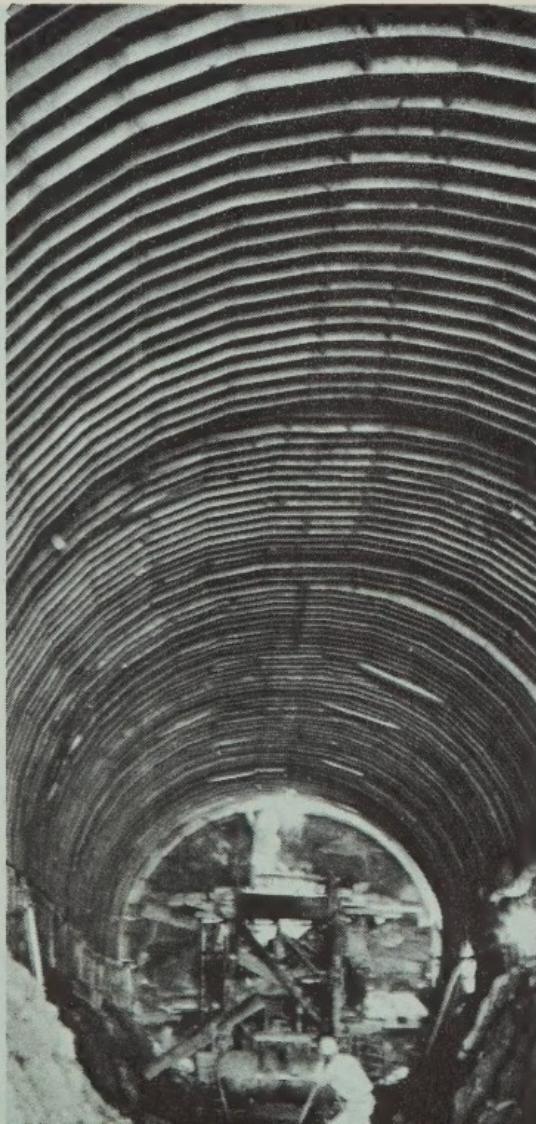
The land was sold mainly to prospective Mormon settlers from Utah and construction of irrigation works was largely accomplished by the settlers themselves. This included the establishment of a weir and headgate on the St. Mary River at Kimball with a canal leading to the Magrath and Lethbridge areas.

By 1901, it was possible to irrigate 3,000 acres in the Magrath area and 600 acres near Lethbridge. A year later additional acreages around Stirling and Raymond were brought under the ditch. By 1919, some 65,000 acres of land were being irrigated. The same year an agreement was reached with the A. R. & I. to supply water to an additional 17,000 acres in the Taber district. Later, canal enlargements and other improvements were made and by 1942 a total of 127,000 acres of land were ready for irrigation. However, because of a lack of storage and irregular stream flow, only 120,000 acres were given water rights, and even this acreage suffered for lack of water in the late summer of most years. This was the situation until new sources of water made possible through the development of the St. Mary Irrigation Project could be found to augment existing supplies.

ST. MARY IRRIGATION PROJECT

The St. Mary Irrigation Project was started in 1946 as a joint undertaking of the Governments of Canada and Alberta. Ultimate aim was to provide sufficient water, canals and other works so that some half a million acres of land south of the Oldman River in Alberta could be irrigated. This area lay between Lethbridge and Magrath in the west, and Medicine Hat in the east. Water for the project comes from the St. Mary, Belly and Waterton Rivers, and full utilization of Canada's share of these streams is planned. To date, all principal water storage and supply works associated with the project have been constructed, and 296,000 acres of the 500,000 acres potentially irrigable on the scheme are being served.

Waterton Dam diversion tunnel under construction.



ENGINEERING INVESTIGATIONS

Surveys made east of Taber and in the New Dayton—Pakowki Lake area during the 1912–1930 period by the Federal Reclamation Service were forerunners of the development that was later to become known as the St. Mary Irrigation Project. In 1923, D. W. Hays, an engineer with the Department of Interior, was retained to prepare an over-all plan for development, utilizing available waters of the St. Mary, Belly, Waterton and Milk Rivers. This study concluded that 465,000 acres could be irrigated, but work had to be discontinued, following transfer of water resources to the Provinces in 1930 and disbandment of the Federal Reclamation Service.

In 1935, when PFRA came into the picture, further consideration was given to the problem. On receipt of strong petitions from irrigation farmers in the area, PFRA engineers headed by W. L. Foss, were instructed to renew investigations on the project.

At the outset, at least two major changes to the plan conceived by Hays appeared desirable: (1) locating reservoirs directly on rivers rather than inland, and (2) extending irrigation to the Medicine Hat area where climatic and soil conditions indicated great need.

Late in 1938, a site for the St. Mary Dam was located and shortly thereafter, a canal route was laid out across Forty-Mile Coulee and east over the Winnifred ridge to the Medicine Hat area.

The plan included reservoirs on the St. Mary and Waterton rivers, and several inland ones along the main canal. By 1941, general plans and tentative cost estimates had been completed by PFRA engineers. That year the Meek Committee was appointed by the Federal Government to look at these plans and report on feasibility. The committee report was published in 1942, recommending not only construction but the participation of the senior governments in the cost of the project. In 1945, tentative agreement on the sharing of costs was reached, and construction began, first on the Jensen Dam and the following year on the St. Mary Dam.

Spillway and reservoir at St. Mary Dam.



JOINT AGREEMENT

As a result of the Meek Report, direct government expenditure on an equitable basis for the construction of major reservoirs, connecting canals and irrigation works became an accepted principle. The benefits from irrigation development, it was assumed, accrued in equal measure not only to the land directly affected, but to surrounding communities, the province and the nation as a whole. Past experience had also shown that the success of any irrigation project depended on the service charge being within the farmer's capacity to pay. For this reason, the construction costs charged to lands to be benefited should not exceed the irrigation value of the project.

These principles were held to in the final agreement. Canada accepted full responsibility for the development of all main storage and diversion works and connecting canals as far east as Ridge Reservoir (see map), as well as the provision of all engineering services required to develop the entire project. Alberta assumed responsibility for the construction of the main canals from Ridge Reservoir east, the distribution systems and inland reservoirs, as well as for settlement and agricultural development on the project. Alberta, however, recovers part of this capital cost from the farmers at a rate of ten dollars per irrigable acre.

Operation and maintenance of the federally-financed portion of the project is conducted on a continuing basis by Canada, while Alberta assumes costs of delivering water to provincial works at a rate not to exceed 25 cents per acre foot. Alberta, in turn, assesses the farmers with all operation and maintenance costs.

PRINCIPAL STRUCTURES

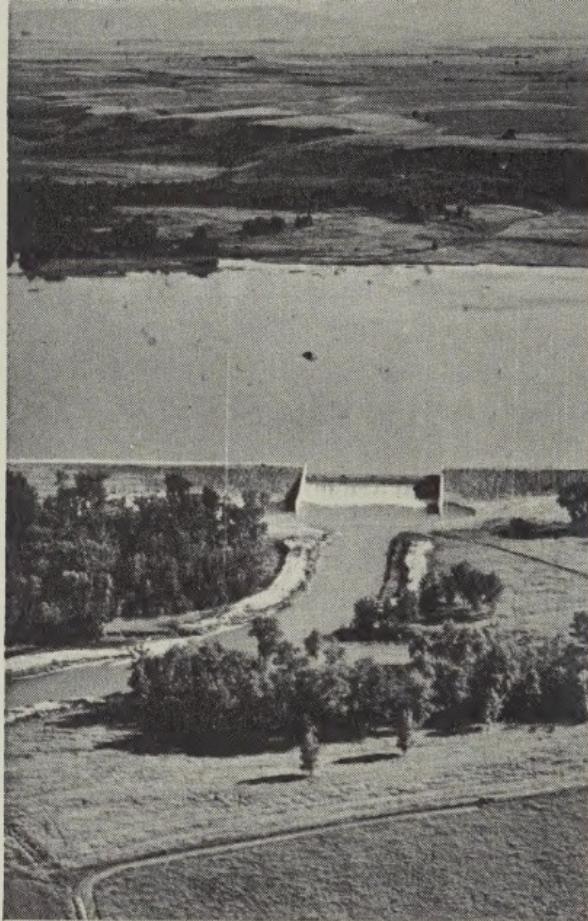
Key structure in the project is the St. Mary Dam, located on the St. Mary River about 35 miles southwest of Lethbridge. Further use of the St. Mary River is dependent on this dam and the storage it provides. This not only assures adequate water for the 120,000 acres already being served, but for the extension of irrigation to an additional 94,000 acres.

Construction was started by the Federal Government in 1946 and completed in 1951. The dam, which created a 17-mile long reservoir with a storage capacity of 320,000 acre feet of water, is of compacted earth fill construction, stands 202 feet high and is almost half a mile long. Water supplied from the reservoir is delivered by way of a 17-foot-diameter concrete tunnel to a main outlet canal serving the irrigation districts. Other major structures built along the extent of the canal system to balance flows and provide additional storage included the Chin, Jensen, Ridge and Grassy Lake Reservoirs. This represented the first stage in development of the water resources potential on the St. Mary Project.

The next step was to control the waters of the Belly River. This involved building a diversion weir on the Belly River immediately west of the St. Mary Dam, and excavating 27 miles of connecting canal to divert Belly River water into the St. Mary Reservoir. Started in 1956 and completed the following year, this development made it possible to extend irrigation to another 48,000 acres.

Final stage in construction has been the damming of the Waterton River, and running a canal to the Belly River, to provide additional storage and facilities for diversion of water into the over-all St. Mary Irrigation system. With completion of these works, the final step in the development plan to harness the water resources in these three major streams for irrigation has been taken.

Construction of the Waterton Dam and appurtenant works began in 1958. A diversion tunnel was first required to pass the flow of the river around the area of the dam so that work could go forward. The diversion was accomplished in the fall of 1960, and then construction of the dam proper got under way. Now completed, this dam creates a reservoir with a total storage capacity of 140,000 acre feet of water. This, together with the diversion facilities provided, will make possible the development of remaining acreages of potentially irrigable land on the project.

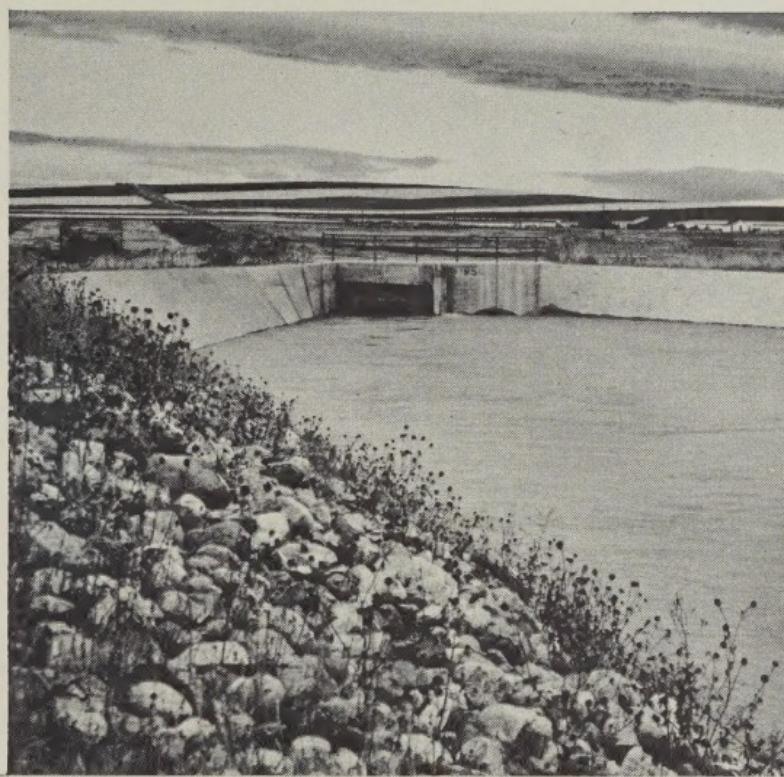


Belly River diversion weir.

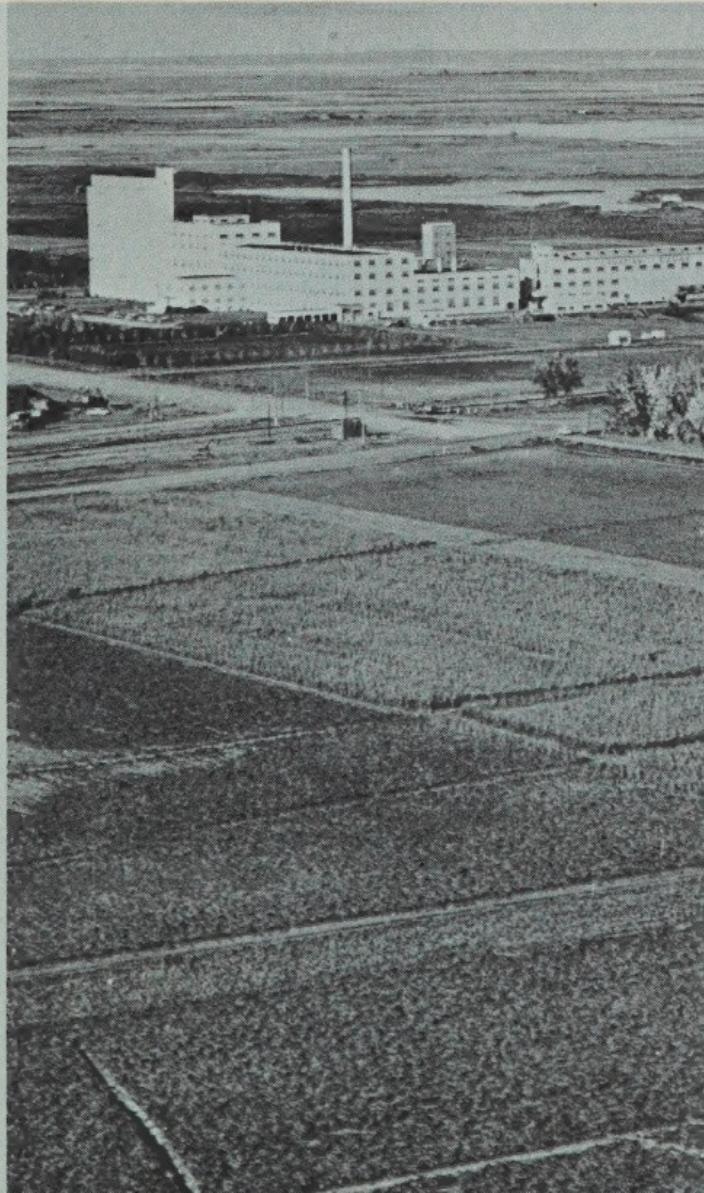


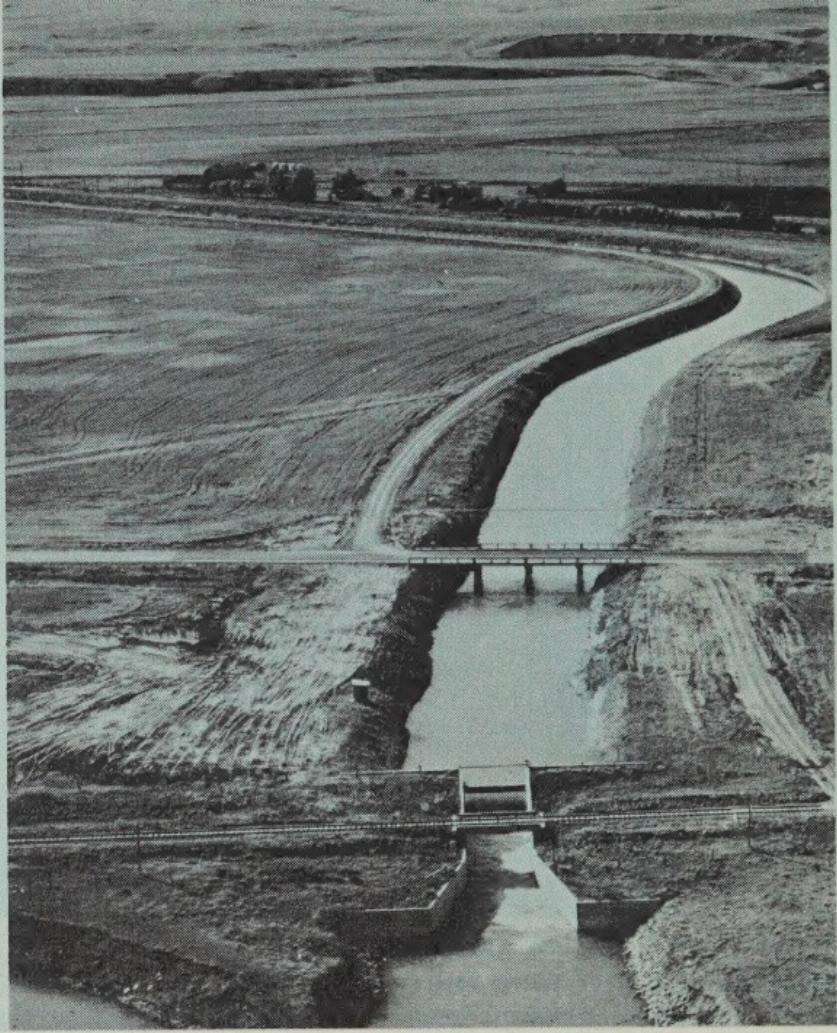
Jensen Reservoir showing canal to Taylor Chute.

Outlet works at Pinepound Siphon.

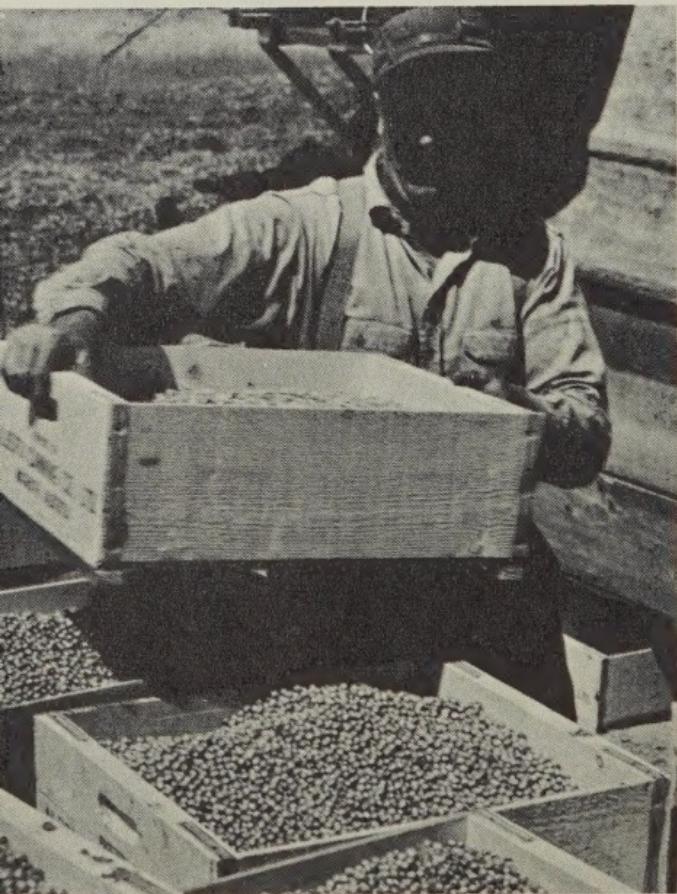


Sugar refinery near Taber and irrigated fields.





Main canal near Spring Coulee.



Packing peas near Magrath.

Spray from heavy flow in Raymond Chute.



Irrigating potato crop.



IRRIGATION

Although irrigation development on the St. Mary Project has suffered many setbacks over the years, there can be little doubt as to the value of irrigation in terms of the security it has provided farmers in the area, and benefits which have accrued to the region and nation as a whole.

For this success, much credit must go to the early Mormon settlers. Their zeal and enterprise, as well as their knowledge and experience in irrigation brought from Utah, set the stage for rapid progress in irrigation development within the area. The Mormon influence also contributed to the early lead that was taken growing specialized crops on the St. Mary Irrigation Project.

Initially, main emphasis was on sugar beets for which the local climate and soil were well suited. By 1905, the first sugar processing factory had been built at Raymond, south of Lethbridge, followed later by the establishment of a second plant at Picture Butte. Then in 1950, with the extension of irrigation eastward, a third factory was established at Taber.

The major factor hampering development was lack of markets with imported cane sugar providing keen competition. Later, import duties were imposed, favoring Canadian beet sugar producers. Similarly new specialized crops in the area moved slowly with only gradual improvement in market opportunities. Nevertheless, by 1953, over 34,000 acres on the St. Mary Project were devoted to specialized crops. By 1959, this had increased to 70,000 acres and in 1965 to over 100,000 acres. As markets developed, new processing industries became established. Major crops, in addition to sugar beets, are corn, peas, beans, potatoes, oilseeds with small acreages of carrots and other vegetables.

Forage and legume crops are grown in rotation with specialty crops, and by-products from such crops as sugar beets, peas, etc., have encouraged the livestock industry. Livestock sales through the Lethbridge stockyards in 1965 amounted to \$48 million indicating the growing importance of this industry to the economy of the region.

The St. Mary Irrigation Project is about completed. What was once a treeless waste has been transformed—thanks to irrigation—into one of the most densely populated and prosperous agricultural areas in Western Canada. And it has all happened within a period of 65 years.

Waterton Dam looking west.



Statistics of Major Structures in St. Mary Project

ST. MARY DAM

Height of dam	202.5 feet
Length of dam	2,536 feet
Base width of dam	1,480 feet
Volume of dam	4,500,000 cu. yds.
Length of reservoir	17 miles
Area of reservoir	9,000 acres
Total reservoir capacity	320,000 ac. ft.
Spillway capacity	53,000 c.f.s.

WATERTON DAM

Height of dam	180 feet
Length of dam and dykes	3 miles
Base width of dam	1,350 feet
Volume of dam	6,000,000 cu. yds.
Total reservoir capacity	140,000 ac. ft.
Spillway capacity	50,000 c.f.s.

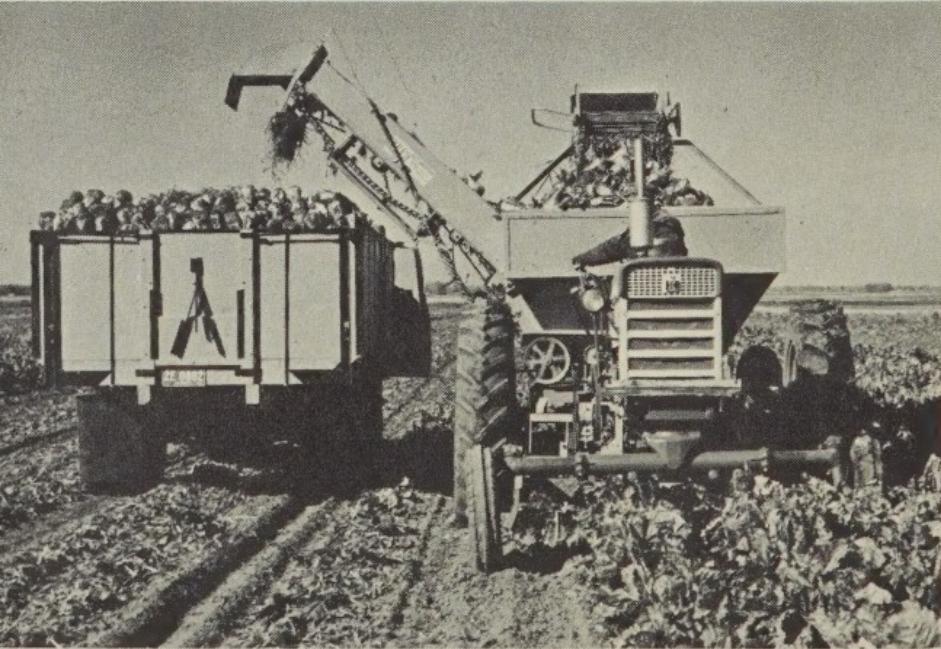
MAIN CANALS

Waterton Reservoir to Belly River	5 miles-2,000 c.f.s.
Belly River to St. Mary Reservoir	27 miles-2,450 c.f.s.
St. Mary Reservoir to Ridge Reservoir	26 miles-3,200 c.f.s.
Ridge Reservoir northeast (initial)	200 miles-3,000 c.f.s.
Ridge Reservoir east	1,100 c.f.s.

PRINCIPAL STORAGE RESERVOIRS

(Figures represent live or usable capacity)

Waterton Reservoir	93,000 ac. ft.
St. Mary Reservoir	290,000 ac. ft.
Ridge Reservoir	100,000 ac. ft.
Chin Reservoir	175,000 ac. ft.
Grassy Lake Reservoir	10,000 ac. ft.
Murray Reservoir	25,000 ac. ft.



Harvesting sugar beets near Taber.

ST. MARY RIVER PROJECT

LEGEND

— CANALS

- - - PROPOSED CANALS

RESERVOIRS

PROPOSED RESERVOIRS

NEW DISTRICT SERVED

OLD DISTRICT SERVED

PROPOSED DISTRICT SERVED

TURIN

PICTURE BUTTE
NOBLEFORD

OLDMAN
BARNWELL

DIAMOND CITY
LETHBRIDGE

KIPP
CHIN

LETHBRIDGE

CHIN
RESERVOIR

WILSON

STIRLING

RAYMOND
RAYMOND
RES.

CRADOCK

WRENTHAM

NEW DAYTON

MAGRATH

RIDGE
RESERVOIR

MCNAUL

VERDIGRIS
RESERVOIR

JENSEN
RESERVOIR

SPRING
COULEE

RALEY

CARDSTON

GLENWOODVILLE

HILLSPRING

WATERTON
RESERVOIR

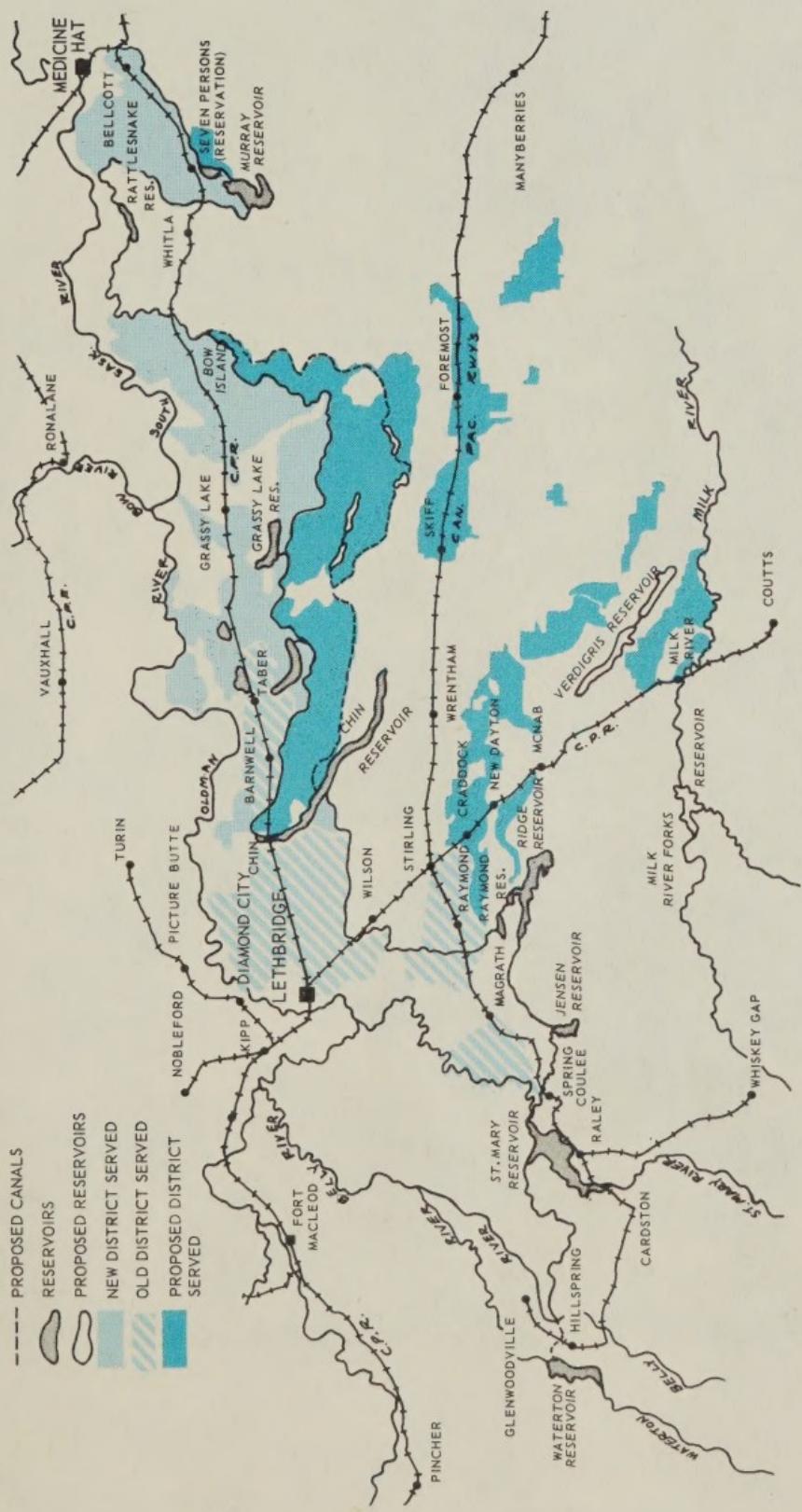
PINCHER

ST. MARY
RESERVOIR

MASTODON

WHISKEY GAP

COUTTS





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